IN THE SPECIFICATION:

Please amend the specification as follows:

Please replace the paragraphs beginning at page 8, line 25 through page 11, line 10 with the following rewritten paragraphs.

However, the above patents employing the above described purification method are a fixed type purification system which is designed to be fixed in place to have a specific amount. Accordingly, although the patents may be useful for purifying an indoor air of a large sized building, e.g., a limited amount of air, they are still inadequate to ~~be~~ freely stick to a purification amount because ~~an~~ of extra installation expense and an operating cost are required ~~therefor~~ therefore.

SUMMARY OF THE INVENTION

It is, therefore, an object of the present invention to provide a purification system of exhaust gases of an internal combustion engine for vehicles for using precious metals as a high temperature active catalyst, e.g., a 3-way catalytic converter, and for using a photocatalyst coated ~~in~~ on a honeycomb as a low temperature catalyst, in which both reactions of an oxidation and a reduction are simultaneously accomplished in high and low temperatures by using a low temperature plasma as a photic source to thereby purify pollutants contained in the exhaust gas and a ~~consume~~ power consumption and a generating strength of a plasma photic source ~~are maintained depending~~ dependent upon an installing position of electrodes.

It is ~~an~~ another object of the present invention to provide an atmospheric purification system for purifying the atmosphere during driving of vehicles and an operation of an air-conditioner thereof regardless of a settled purification amount by coating a photocatalyst on a heat exchanger and irradiating light thereto because an

internal combustion engine of the vehicles is cooled by the atmosphere in moving, e.g., an air-cooled type, and a condenser of the air-conditioner is exposed to the atmosphere.

It is a still another object of the present invention to provide a deodorizing and atmospheric purification system for purifying pollutants and a bad smell in air by generating a plasma after coating a photocatalyst and a precious metal catalyst on a carrier and irradiating ~~photo~~ photon from a photic source.

The above and other objects of the present invention are accomplished by providing a purification system of exhaust gases in an internal combustion engine for purifying the exhaust gases by disposing a reaction furnace capable of reducing noxious components of the exhaust gases in an exhaust pipe of the internal combustion engine, the system comprising:

A reactor including a honeycomb carrier having a plurality of carrier cells, each of which a photocatalyst layer is coated on, in the reaction furnace, and a plasma generating means having a plurality of electrode cells and mounted on an inner end and an outer end of the honeycomb carrier.

In accordance with a preferred embodiment of the present invention, the honeycomb carrier includes a 3-way catalyst layer coated on a wall surface of each of the carrier cells and a photocatalyst layer coated on the 3-way catalyst layer, the photocatalyst layer being activated by a plasma photic source. Further, a volume and a number of each of the electrode cells are varied depending upon the variation of ~~that of~~ each of the carrier cells, the carrier cells having 100 – 900 numbers per the united area (1 inch X 1 inch).

Please replace the paragraphs beginning at page 24, line 8 through page 25,

line 26 with the following rewritten paragraphs.

In the same manner as described ~~to~~ for the embodiment of Fig. 2, a magnitude and a number of the carrier ~~cell~~ cells 34 and the electrode cells 52a and 52b are varied depending upon the amount of the exhaust gases and the concentration of pollutants therein.

The operation of the purification system of the exhaust gases in an internal combustion engine in accordance with a ~~modification~~ modified embodiment of the present invention will be described hereinbelow.

When the internal combustion engine operates, the exhaust gases are introduced into the reaction furnace 20 and, at the same time, a power supply 56 is applied to the electrode terminals 54a and 54b to thereby allow a current to flow into the ~~honey~~ honeycomb electrodes 50a and 50b located at both ends of the honeycomb carrier 30.

Hence, a plasma is discharged from an edge 62 of the electrode cell 52a located at one end of the carrier cell 34 to the edge 62 of electrode cells 52b located at the other end thereof. At this time, the edge 62 is located at a center of each of the carrier cells 34 and the honeycomb carrier 30 is made of ceramic to ~~not~~ thereby ~~flow~~ prevent a current from flowing therethrough, the honeycomb electrodes 50a and 50b located at both ends of the honeycomb carrier 30 are conducted to each other to allow the plasma to be discharged into an internal portion of each of the carrier cells 34.

The plasma photic amount generated at the honeycomb electrode 50a distinctly disposed from the honeycomb carrier 30 is larger than that generated at the honeycomb electrode 50b closely disposed to the honeycomb carrier 30. In order to obtain an additional plasma photic amount, all of the honeycomb electrodes 50a and 50b are distinctly disposed from the honeycomb carrier 30, but

it is preferable that one electrode 50a is closely disposed to the honeycomb carrier 30, while the other electrode 50b is distinctly disposed therefrom.

The discharged plasma activates the photocatalyst of the photocatalyst layer coated on a surface of the carrier cells 34 to thereby produce a free radical, purifying unburned hydrocarbon, nitrogen oxide, and carbon monoxide. Since the photocatalyst reaction shows a regular purification capability in all of the ranges of the mixture ratio regardless of the theoretic mixture ratio of an internal combustion engine, the purification capability is continuously maintained although the engine is operated at a range ~~exception of the theoretic~~ ratio, not just at the theoretical mixture ratio.

Please replace the paragraphs beginning at page 32, line 3 through page 35, line 23 with the following rewritten paragraphs.

As shown in Fig. 11, in case of installing the oxygen supplying portion 80 in the exhausting pipe 14, when the pressure in the reaction furnace is lower than the atmospheric pressure, a force for pushing the plate 84 by the atmospheric pressure is introduced to the spring 86, while when the difference is larger than the stiffness of the spring 86, the spring 86 is compressed to thereby open the plate, resulting in ~~that an~~ external air ~~is~~ being introduced into the exhausting pipe 14. That is, if the atmospheric pressure Po is larger than the sum of the pressure Pi in the exhausting pipe 14 and the pressure Ps of the spring 86, the plate 84 is opened as following formula:

$$Po > Pi + Ps$$

As shown in Fig. 12, in case of installing the oxygen supplying portion 80 to an ~~external~~ exterior of the exhausting pipe 14, if Po + Ps > Pi, the plate 84 is opened to thereby allow the external air to be introduced into the exhausting pipe

14. The operation thereof is the same as described above.

In a modification as described above, but not shown, ~~it is of course that~~ the oxygen supplying portion 80 may be further provided with a solenoid valve and then the oxygen concentration in the exhausting pipe 14 may be increased by controlling the solenoid valve linked with a timer or a controller to allow the external air to be introduced into the exhausting pipe 14.

The oxygen supplying portion 80 may further include an air introducing pipe 90 having an opening port 88 as shown in Fig. 13. Also, ~~The~~ the air introducing pipe 90 may further include a blowing fan 92 therein to thereby artificially increase a pressure ~~operated~~ to the plate 84 and to thereby allow the external air to be easily introduced into the exhausting pipe 14, resulting in ~~that~~ the oxygen concentration in the exhausting pipe 14 ~~is~~ being increased.

On the other hand, the invention may be used as an atmosphere purification system using an operation of an air-conditioner and a driving of vehicles.

As shown in Fig. 15, a radiator 104 is connected as a heat exchanger to an internal combustion engine 102 disposed ~~to~~ in an engine room 100 of vehicles. Cooling water is circulated between the internal combustion engine 102 and the radiator 104 to thereby allow ~~heats~~ heat generated in operating the internal combustion engine 102 to be discharged ~~to an external~~ externally.

The radiator 104 is provided with a cooling fan 106 for rotating at a low or a high speed according to a driving condition and a traveling speed of vehicles to allow an introduced air to be blown to the radiator 104. Further, the radiator 104 includes a plurality of cooling pins 110 so as to maximize a surface area, resulting in that energy contained in the cooling water flowing through a cooling pipe 112 is speedily discharged ~~to the external~~ externally.

A grille 114 is disposed to a front portion of ~~vehicles~~ the vehicle to ~~be~~

~~thereby introduced an~~ introduce air therethrough, thereby passing through the radiator 104 in ~~driving the vehicles~~ a moving vehicle.

In the vehicles as constructed above, a photocatalyst is coated on the radiator 104 of the inventive atmosphere purification system in accordance with the present invention and, more ~~preferable~~ preferably, a photocatalyst layer 116 in which the photocatalyst is deposited is coated on a surface of the cooling pin 110. ~~A various type~~ Various types of ~~photocatalyst~~ photocatalysts may be used, but the atmosphere purification system in accordance with the present invention utilizes titanium dioxide (TiO_2). As described above and is well known, the photocatalyst is ~~exited~~ excited by a specific wavelength, the process is expressed as the following reaction formula:

$TiO_2 \rightarrow TiO_2 (h+) + e^-$

$TiO_2 (h+) + e^-$ is an ion having a very strong reactivity, thereby ~~exiting~~ exciting H_2O or O_2 and then accelerating and redoubling a production of a free radical (J. of Adv Oxid. Techol Vol., No. 1, 1996, p67-p78). These ~~photoctalyst~~ photocatalysts are deposited in a carrier such as a gamma alumina to thereby form a photocatalyst layer.

The photic source for ~~exiting~~ exciting the coated photocatalyst utilizes sun's ray irradiated to an engine room 100 through a grille 114 of vehicles or ~~a~~ an ultraviolet lamp 118 for irradiating ~~a~~ an ultraviolet ray in a neighboring position of the radiator 104. The wavelength of the ultraviolet ray irradiated from the lamp 118 is about 360nm.

The ultraviolet lamp 118 is provided with a reflective mirror 120, wherein it is preferable that an inner side of the reflective mirror 120 is directed to the radiator 104 to thereby protect the ultraviolet lamp 118 from ~~an~~ a pressure due to a flow rate of air introduced through the grille 114 in traveling ~~the~~ vehicles and to thereby

reflect the ultraviolet ray irradiated from the ultraviolet lamp 118, thereby increasing an irradiating amount of the ultraviolet ray to the radiator 104.

According to the above construction, since the inventive atmosphere purification system allows air to always flow through the grille 114 to the radiator 104 in traveling of the vehicles, when the air passes through the radiator 104, the photocatalyst of the photocatalyst layer 116 is ~~exited~~ excited by the ultraviolet ray irradiated from the ultraviolet lamp 118 to thereby form a free radical capable of purifying pollutants such as VOC (volatile organic components) and nitrogen oxide contained in the air.